

REMARKS

In response to the official action:

Claims 1-10 are rejected for double patenting.

The claims are all rejected over the claims of U.S. Patent 6,621,169, which issued from the parent application. This rejection is respectfully traversed.

(Prior to arguing against the rejection, the Applicants note that the term of Patent 6,621,169 is not extended, but they expect that the term of the patent issuing from this application *will* be extended by about five months, which is the time between the date on which the Examiner mailed the Office Action and a date which is 14 months after the application date (under 35 U.S.C. § 154(b)(1)(A)(i)(I)). Thus, a terminal disclaimer would shorten the term of the patent issuing from this application by about five months.)

The double patenting rejection is believed to be contrary to 35 U.S.C. § 121, which states, “A patent issuing on an application [that was restricted] shall not be used as a reference ... against a divisional application.” Also, MPEP § 806.04(h), titled “Species Must be Patentably Distinct From Each Other,” states that “the examiner should not require [election of species] unless he or she is satisfied that he or she would be prepared to allow claims ... over the parent case, if presented in a divisional application.” In the parent case, the PTO already made a decision that the claims of this application and Patent 6,621,169 are patentably distinct from each other, contrary to the Examiner’s statement at the bottom of page 2 of the Office Action.

In addition, the legal standard which the Examiner applies at the top of page 3 of the Action is respectfully believed to be in error, inasmuch as the *disclosure* of the parent is believed to be irrelevant in obviousness-type double patenting. (There, the Examiner states that the instant claims are “fully disclosed in the patent.”) Moreover, the asserted common subject matter (page 3, line 3) is merely the title of the application and the rejection is not explained.

Withdrawal of the rejection is requested.

Claims 1-10 were rejected under 35 U.S.C. §102 as being anticipated by Moden (U.S. Patent 6,297,960). This rejection is respectfully traversed.

Moden discloses a stack of assemblies 100, each comprising a heat transfer plate 50, a semiconductor chip 102 (“DIE” in Fig. 1), and a substrate 104. The heat transfer plate is in contact with the “inactive” side of the chip (col. 3, line 36). Each substrate 104 is electrically connected to the adjoining upper and/or lower substrate 104 by solder balls 106.

(1) The Applicants respectfully point out that, contrary to the Examiner's assertion at page 4, line 2, Moden discloses wire bonding only as its prior art, and not as part of its illustrated embodiments. The mention of wire bonding noted by the Examiner is unrelated to any disclosed stacked semiconductor device of Moden's prior art, and all of Moden's disclosed invention embodiments use solder balls.¹ Thus, there is no anticipation by any one complete embodiment; the Examiner is actually *combining* Moden's disclosed embodiments with Moden's admitted prior art, and there is no anticipation.

(2) With respect, the Examiner's statements do not correspond to the reference signs in the figures of Moden. The Examiner asserts on page 3 that:

- element 102 of Moden anticipates four distinct elements: a first terminal, and second terminal, and a first semiconductor chip, and a second semiconductor chip; and that
- element 104 anticipates both a first substrate and a second substrate.

In fact, the Examiner applies exactly two elements of Moden, these same 102 and 104, against *every* feature of the Applicants' claims, except the wire bonding mentioned above. As to the asserted wire bonding, no number is cited, which supports the Applicants' arguments in the preceding paragraph (1).

1 E.g., col. 3, lines 34, 46-47; col. 5, lines 35; col. 6, lines 2-3, 11, and 19.

(3) The Examiner at the top of page 4 asserts Moden's disclosure of "the second terminals 102 being connected to the first terminals [also 102, according to the Examiner] by wire bonding (col. 3, lines 30-31)." That is, the Examiner asserts that Moden's semiconductor chip is connected to *itself* by wire bonding. That would be most unusual, and it is certainly not at all disclosed. Moden says that wire bonding is used to connect a chip to *other* devices (col. 1, line 30). No wire bonding is shown in the drawing figures referenced by the cited text, but solder balls 106 *are* shown, and they are referred to as such four times in the applied passage.

(4) Claim 1 recites that "the second terminals are formed on the second substrate," which in the Examiner's scheme means that the Moden's die (chip) 102 is "formed on" Moden's substrate 104. But Moden discloses these as distinct parts of a stacked assembly, and a semiconductor chip always has its own substrate that it was already formed on; being "formed on" and second substrate is not disclosed.

(5) Regarding the new claims, the Examiner applies Moden's heat transfer plate against the "substrate" of claim 1, but in new claim 11 the "second substrate" is renamed as a "circuit board" (exemplified by element 32 in Fig. 3). Moden does not disclose this. Moden's heat transfer plate is not a "circuit board," because it is solid metal and therefore cannot include any circuits (any circuit would be a short circuit).

That the heat transfer plate is made of metal is shown by the following: (1) the cross-hatching in the drawing indicates that the heat transfer plates 50 are of metal; (2) from its name, the plate is heat conductive; (3) Moden takes steps to keep the plate away from contact with both the active side of the chip and the solder balls (col. 3, lines 44-46), implying that the plate is electrically conductive as well as conductive of heat. As the Examiner knows, only metals are conductive of both heat and electricity. In addition, the heat transfer member 150 of Fig. 9, which is similar in function to the heat transfer plate, is of metal (col. 5, line 42).

(6) The rejections of the dependent claims on page 4 of the Action are respectfully traversed for not being explained in any way, and adding nothing to the rejection of claim 1. For example, notches are recited in claim 4 but the Examiner cites no element of Moden as anticipating them.

Withdrawal of the rejections and objections, and allowance of all claims, is requested.

Respectfully submitted,

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